ENTRIX
ENVIRONMENTAL CONSULTANTS

ENTRIX, Inc.
42958 Okemos Road, Suite 101
Okemos, MI 48864
(517) 381-1434 | Fax (517) 381-1435
Web: www.entrix.com

January 17, 2006

**Memo re: Response to USEPA review of Draft Baseline Ecological Risk Assessment Work Plan**

---

In this memo, we provide a disposition of comments including responses and/or clarifications regarding each of the comments that were raised by the USEPA review of the Draft Baseline Ecological Risk Assessment (BERA) Work Plan.

Responses and clarifications will be presented in Arial font along with the original comment text as provided in the review by USEPA (dated October 14, 2005). For clarity, the original comment text will be indented and italicized.

*1. This work plan needs to be revised to incorporate MDEQ goals and requirements into Sections 1.1 (Purpose and Scope) and 3.1 (Introduction for Problem Formulation). Specifically, a risk management goal needs to be developed by MDEQ which states what level of resource protection is expected for water (e.g., refer to beneficial uses in Michigan water quality standards), sediment and soil. The risk management goals and needed risk assessment products set the stage for the risk assessment with respect to what type of information is needed to support the risk management decision. This direction at the beginning of the risk assessment will keep the project focused on producing useful information for the risk managers.*

The intent of this BERA work plan is to establish an interactive process with the agencies to assure that the project remains focused and provides the information needed by the risk managers. After the approval of the work plan, it would be appropriate to identify a technical work group with agency representatives to promote dialog throughout the risk assessment process and address the scientific management decision points (SMDPs) as they are reached. The SMDP #2 presented in section 3.7, relates to the problem formulation phase of the BERA and could be used to discuss and identify the management goals and risk questions.

*2. In Section 2.2 (Scientific Management Decision Point #1) three potential decisions that can be reached following the SLERA are presented. Although these options are consistent with the 1997 U.S. EPA Superfund Ecological Risk Assessment Guidance, there may be an instance when screening values are exceeded by such a large degree (i.e., severe risk) that some form of cleanup or interim control measure would be appropriate (note, this could become one of the risk management goals for comment #1). A fourth decision option needs to be added to show that action (cleanup or interim measure) is required when severe risk conditions exist.*

USEPA guidance states that a decision can be made to proceed with cleanup after any tier of the ERA process and the example is given of sites of relatively small size where contamination has a sharply defined boundary. Conversely, for many sites it is preferable to move directly to a baseline ERA after the initial screening when remediation to conservatively derived levels is not the obvious choice in terms of cost and environmental impact. Since the existing information from past and ongoing field studies by MSU have not indicated any obvious ecosystem anomalies or sharply defined boundaries of contamination that would warrant immediate interim action, this option has not been added as a fourth decision option for SMDP#1.

*3. The selection of receptors of concern in Table 3-3 (Proposed Receptors) needs to follow after the conceptual model and assessment endpoints are established. Since no carnivorous mammal is listed in Table 3-3 (the short-tailed shrew is an insectivore) either the long-tailed weasel or a red fox would be preferred over a coyote (see Figure 3-1) as their feeding home range is smaller and would have greater potential exposure to site contaminants. Of the three mammalian carnivores the long-tailed weasel would have the smallest home range.*

Figures 3-1 and 3-2 have been revised to more closely match the proposed receptors as presented in table 3-3. A mammalian top predator has not been included in the list of receptors of concern because the likely candidates, red fox, long-tailed weasel, and coyotes, have mitigating factors that reduce the potential for exposure. For example, red fox diet can include up to approximately 31% herbaceous material (USEPA, 1993). In addition, field observations from the MSU research team and local trappers suggest that the floodplain does not offer significant areas of suitable habitat for the red fox or long-tailed weasel and thus these species are rarely seen on site. The coyote represents an alternative terrestrial carnivore since they are abundant on the floodplain and are frequently trapped along the river. However, the coyote has a larger foraging range than the red fox. This expanded foraging range likely extends outside of the area of concern.

*4. Sediment/ silt deposition on flood plain vegetation needs to be presented in the conceptual model (Section 3.5) for herbivore exposure. This exposure path way needs to be considered since previous studies have shown other herbivores (e.g., deer) to have high contaminant levels in their tissue. Please note the terrestrial vegetative sampling and analysis plan presented in Appendix C (Section 1.5.3, 3rd paragraph, first and last sentences) is designed to wash all vegetation prior to analysis. This washing of vegetation is not recommended since it will remove any natural dust and river silt deposited on vegetative surfaces and will limit the risk assessment only to consider contaminant transport to plants from soil via root and vascular tissue systems.*

The amount of soil/sediment present on vegetation at the time of sampling is impacted by the recent weather conditions (dry and windy, light rains, or heavy rains with flooding) and local events (large scale landscaping or field plowing). The resulting COPEC concentrations for plants that are not washed would vary greatly and it would not be possible to account for all the variables that impact that concentration range. Alternatively, incidental soil ingestion values are available from the literature and allow the use of site specific soil and sediment concentrations to estimate exposure from soil intake. Incidental soil ingestion values include all sources of ingestion of soil including that from plant consumption. This concept is included in the generalized exposure model depicted in equation 5-1. Because incidental ingestion of COPECS associated

with soil, including that on the surface of plants, is already included in the exposure modle, not washing off surface contamination of plants would result in double-counting.

> *5. Dietary exposure modeling (Section 5.1.1) does not indicate what is an acceptable exposure time interval for the representative species and the desired assessment endpoints. These exposure time intervals need to be identified and later compared to actual data collected along with variations from the acceptable exposure time interval discussed in the uncertainty section.*

Text was added to section 5.1.1.2 "Estimation of Oral Exposure for Avian and Mammalian Wildlife Receptors" to describe how area-use factors in the exposure model will account for behavioral, spatial, and temporal factors that can affect exposure of a receptor. In addition, chronic exposure is assumed for all receptors at the Site.

> *6. The reference (Travis and Hattemer-Frey 1991) cited in Section 5.1.1.1 (Exposure Characteristics of Avain and Mammalian Wildlife Receptors) for water ingestion, inhalation and dermal is intended for Human exposure not wildlife. This reference needs to be replaced with that given in the U.S. EPA Guidance for Developing Ecological Soil Screening Levels, OSWER Directive 9285.7-55 (Attachment 1-3, Review of Dermal, and Inhalation Exposure Pathway for Wildlife).*

The text was modified as suggested.

> *7. When a toxicity reference value (TRV) is developed numerous factors that may influence toxicity (e.g., retention time, absorption, detoxification, etc.) are not specifically measured. In selecting a TRV, factors influencing toxicity are assumed to be comparable when the TRV test organism is the same or closely related to the target organism. By inserting an adjustment only for "fractional absorption value" (FAV) in Equation 5.1 the exposure estimate will likely under compensate (when the test and target species are the same or similar) and will not consider other toxicity influencing factors. The FAV needs to be deleted from equation 5-1 and use the original exposure model developed by Sample and Suter (1994). Also the site use factor (SUF) appears to be incorrectly presented (see equation 7 in section 2.3 of the Sample and Suter 1994 reference) and should be expressed as "site area/foraging area."*

The use of FAVs relative to the exposure model has been modified. The exposure model that will be used in modeling exposure of wildlife receptors is based on the generalized exposure model given in the Eco-SSL guidance. The model presented in the BERA work plan has been modified to reflect potential differences in bioavailability

of chemicals associated with soils but not for dietary items. For dietary items, it will be assumed the absorbed fraction of a chemical in a dietary item in the field is similar to that observed in laboratory studies. The presentation of the site use factor has been modified as suggested.

> *8. Uncertainty (Section 5.1.4) in the tissue residue-based approach will be influenced primarily by the amount of time spent feeding in the contaminated area by a receptor. This sentence needs to be revised.*

The text has been revised as suggested.

> *9. It's not clear how other modifying factors (Section 5.2.1.3.4) will be selected. Additional discussion is needed.*

The text in all sub-sections of 5.2.1.3 has been revised considerably to clarify the intended use of uncertainty factors as requested.